Conference on Effectively Restoring Ecosystems
22-24 August 2000, St. Louis, Missouri

BACKGROUND

Session: Plenary 8
Topic: Building What We Plan
Moderator: Mike Klosterman, CECW-E
Recorders:

- Jeff Laufle, CENWS-PM-PL-ER
- Larry Ives, CENAO-PL (flip charts)

Panelists:

- Dick Cole, CEIWR-PD
- Meg Jonas, CENAB-EN-GH
- Pete Juhle, CECW-E

Objective: This session addressed the broad topic of ensuring that the planning team's conceptual ideas are correctly implemented throughout design, construction, and operation of a project.
Description: Mike Klosterman introduced the session and the panel, and said that the panelists' presentations would be followed by discussion from the audience, which would be captured for the record. Dick Cole presented lessons learned concerning the success of Corps restoration projects. Much of the information came from studies conducted outside the Corps; primarily in wetlands restoration literature. Meg Jonas offered suggestions on improving the planning process, from an engineer's point of view. Pete Juhle provided a Headquarters Engineering Division perspective.

HIGHLIGHTS

1. Mike Klosterman had prepared the following information in writing (edited for flow). Bracketed items are added from Mike's talk. He put the bulleted items on the overhead projector for the audience and ran through them briefly.

Objective: This session will address the broad topic of ensuring that the planning team's conceptual ideas are correctly implemented throughout design, construction, and operation of a project.

Implementation of the Project Management Business Process (PMBP) is critical to achieving economically effective solutions to ecosystem restoration. [We must do a better job of teaming with all players from the very start and continue to facilitate interaction of all these players toward a better product. That is what the PMBP is all about. The PMBP facilitates transfer of ideas and technologies across organization boundaries. For instance, who should be on project teams? How can we capitalize on the PMBP?]

At the district level, good planners and good project managers have worked for years to implement the PMBP; they just didn't call it by that name. At Headquarters, the creation of the Environmental Team in Engineering and Construction was designed to implement

the PMBP in the environmental area of the Corps. The Environmental Team was formed to address all technical requirements in the environmental arena: ecosystem restoration, environmental mitigation, environmental stewardship, environmental compliance, and hazardous material remediation.

Following are some questions and problems that must be resolved if we are to build what we plan:

- Are there engineering solutions to all of the ecosystem restoration problems being identified?
- Does the technology exist?
- Are planners fully aware of engineering and construction constraints?
- Do engineers understand the desires of the planners?
- Do the planners and engineers appreciate the problems of long term operation & maintenance and their associated costs?
- From a design, construction, and operations perspective what is critical for effective plan formulation?
- How does the PMBP differ from the old Planning Team process? What are some lessons learned from the old process that should be applied to the PMBP?
- What new/updated eco-restoration guidance is needed?
- Problems that must be overcome:
    - Time scale:
        - Engineering & construction is short (5-10 years after completion)
        - Planning is long (100-500 years)
        - The system (along with the project fix) is not static, but evolves over time.
    - Team approach:
        - Requires equal participation by all; not controlled or dominated by Planning or PM
        - Not dominated by seniority, discipline, or personality
        - Requires a good PM
    - We have to monitor what we build over the long term; otherwise there is no accountability. Planners, PMs, and the project team must be accountable.
        - USACE walks away from most ecosystem projects
        - Many projects fall short of developing or reestablishing the functional structure and ecosystem services originally intended
    - Our ability to predict responses to restoration measures is not well advanced.
    - Alternative restoration measures and designs differ significantly among projects in the same kind of eco-system. There are no “off-the-shelf” solutions.
    - Ecosystems are components of larger systems. Understanding the entire system is critical.
    - Solutions may enlist natural forces to achieve the desired restoration.
- Design guidance should help with creative solutions.
- The pursuit of improved eco-restoration design methods and standards should be cross-disciplinary, interbranch/division, interdistrict/division, and interagency.

2. Dick Cole presented the following outline (brackets are added from his talk). Much of this came from outside the Corps, primarily in wetlands restoration literature.

Points

- State of Corps studies of restoration success
  - Not much monitoring is happening
  - May be wasting money building bad designs
  - May be losing an opportunity to lead
- Lessons learned mostly from outside the Corps

Lessons learned:

- Can we build as planned?—not exactly
- Structure changes to conserve functions [Failed projects have often identified specific structural objectives. Projects that identified broader functions have been generally more successful.]
- Uncertainty comes from complexity and randomness [We lack understanding of ecological processes. Random events play a large role, and we need to incorporate that information in our planning. We can address this through scale.]
- Landscape context is controlling and has changed
- Success grows with design scale and naturalness [Many influences come from outside the immediate project area. Many projects are in highly altered environments.]
- What was is less relevant than what will and can be [We need to focus on objectives rather than on the past.]
- Corps needs to set priorities for EQ objectives [We also need to set procedures for scientifically rigorous adaptive management.]

3. Meg Jonas offered the following suggestions on improving the planning process, from an engineer's point of view:

- We tend to work in our comfort zones. We talk about interdisciplinary teams, but it's easier to work with others like ourselves. It's tempting to simply ignore other points of view, but we need to pay attention or risk roadblocks later. The payoff of the interdisciplinary team approach is that it produces the best solutions.
- She echoed on behalf of engineers what Dr. Tuggle requested for USFWS involvement in the planning process:
  - coordinate with us
  - get us involved early in the planning process before decisions or commitments are made (nothing dies harder than a bad idea!)
  - give them the right to perform or contract out engineering tasks
  - and most importantly, treat us as full team members.
- Team members are equal, but each has his/her own role, each defers to others' expertise, and teams are not democracies as such. It's not a mob, it's a team.
- Communication is important. Different disciplines have different technical languages, and we have to learn to understand each other. It's helpful to go out in the field together: when we are looking at the same thing, it improves communication.

- Being a project manager is a tough job. Since PMs act as the interface between the sponsor and us technical people, they need to know enough about the roles of various disciplines to communicate clearly and to knowledgeably market our services. The Corps is unusual in assigning entry-level people as project managers; it would be beneficial if it were a more senior position.
- Engineers are problem solvers—if you give us criteria we will do our best to find a solution. (One problem we often have on environmental projects is that the biological criteria are difficult to define.) The Corps has some of the best hydraulic engineers in the nation. It's an entity with a nationwide experience in both small and large projects. We have developed many of the basic tools used for hydrology, hydraulics, and sediment transport computations. We can use technical tools to achieve environmental benefits.
- Since there is now no technical engineering review of projects at either the division or HQ level, there is no group that sees all the restoration projects nationally or regionally and can assess them from an engineering point of view. This means that when an ecologist proposes a new idea to me at the District level, there is no one that I can call for information on whether we have tried it before, and what the engineering implications are. I would strongly recommend restoring the technical review capability to both division and headquarters so that we engineers in the field have the support we need at higher levels.
- We need more connectivity between disciplines. Although this conference has been excellent, we need conferences that bridge the gaps between different disciplines.

4. Pete Juhle said he initially thought, "Is this a negative topic?" But further thoughts were:

- We don't miss the mark by much—projects may not come out exactly as we plan, but it's often a matter of degree.
- Ecosystem restoration is a difficult process. We need to find good sponsors, and sponsors often have their own motives. Each participant (sponsors, agencies, etc.) may feel that the project did not come out as planned, because they each had a different vision (eg good nesting habitat, vs good view/better property values, etc.).
- We do make mistakes. Our best attempts may fail, but sometimes we have great successes. Bigger, more expensive projects tend to succeed more, and smaller, cheaper projects may be more difficult (for instance there are problems pulling a team together).
- Ecosystem engineering is not reductionist. Outcomes are unpredictable, and we must preach that to participants. We cannot use measures that are too fine.
- The teamwork tool is our best friend and our worst enemy—teamwork is easier said than done.
- One of our biggest weaknesses is our districts' loss of technical expertise. We need incentives to work with neighboring districts, and to share resources and partner with them.

5. At that point Mike opened it up to the audience, looking for success stories and unique problems. Names are used where known.

- A design engineer from WES said that their team works well together and does not seem to share the panelists' problems, at least regarding teams.
- The same person also stated that there is risk in ecosystem restoration, and we need to be willing to take chances.
- Pat Cagney, NWS, agreed with Dick Cole's assessments. He said that river systems are dynamic. We need to look at habitat-forming processes in a landscape context. The best designs are minimal with no water control structures—we want channels to move around.
- An engineer raised an issue of professional integrity of engineers regarding level of protection. She cited an example of overdesign for flood protection in a wetland, where desired overflow into a wetland was prevented by the design. Pete Juhle responded that there is guidance that says a different level of reliability is appropriate for an ecosystem restoration project. The engineer responded that the guidance is vague, and attitudes persist.
- Someone stated that field changes sometimes get made without designers or the environmental coordinator knowing. These changes may vary from permits (eg, a project where sod instead of seed was used, resulting in lost funding and sponsorship). If there is a design failure, engineers may be reluctant to admit it, even if there is no consequence to life or limb.
- Jean O'Neil, WES, said that she agreed with Dick Cole that we need data to keep moving knowledge forward, and if we don't monitor, we cannot be considered preeminent in ecosystem restoration. We need at least low-level monitoring for every project. With regard to the guidance specifying a 1% monitoring cost cap, we need to consider the appropriate cost for inclusion for each project.
- Mike Klosterman wondered how many ecosystem restoration project teams used Corps environmental labs for technical questions, and went to outside sources only if that did not work, as opposed to going straight to other sources. He said we need to use Corps labs, and to work with our engineers.
- Furthering the issue of field engineering, someone commented that we need to work well with our construction divisions, but also get the design we want. Mike Klosterman replied that all team members need to realize that the team can't just walk away when the feasibility phase is completed, but that the environmental people need to maintain contact with designers and to go into the field during construction. Meg Jonas added that that is why we need coordinated technical review.
- Carolyn Murphy, SWG, said they had built a marsh restoration project exactly to specs, but the project did not work. She said we should not consider those design failures, but natural processes were at work. We need to keep on top of a project to make it work. Mike Klosterman asked how she did that. Carolyn replied that they addressed it with O&M funds. If we can't guarantee function, then we need to be able to revisit projects—we don't know enough without monitoring. Pete Juhle said it would be good to have contingency funds. Also, he said, the whole team, not just the engineer, takes the risk for a project.
- The recorder, Jeff Laufle, NWS, was busy keeping notes, but would add here an experience related to the field engineering issue. On one project as PM and environmental coordinator, he had asked for some details to be incorporated during design and was told that as minor as they were, they could be field-engineered.

However, during construction, he was told that because of issues on a previous project with permitting agencies, this project would be built exactly to design, and could not be field-engineered. Thus, the resulting product, while pretty good, lacked some features that could have been easily incorporated and would have improved it, and probably would have been no issue with permitting authorities. We need to ensure good communication with designers and permitting agencies, and to maintain reasonable flexibility. Even site conditions may indicate the need for adjustments once construction starts. It is critical for PMs and environmental coordinators to be on-site during construction, not only to ensure that the desired project gets built, but also to see that environmental compliance/permitting requirements are met (eg protections against silt runoff into water, etc.).